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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/663,843	09/15/2000	Hiromi Okubo	197311US2	4370

22850 7590 02/09/2004

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ALEXANDRIA, VA 22314

EXAMINER

LE, BRIAN Q

ART UNIT	PAPER NUMBER
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2623

DATE MAILED: 02/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/663,843

Applicant(s)

OKUBO ET AL.

Examiner

Brian Q Le

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 16-34 is/are rejected.
- 7) ☒ Claim(s) 14 and 15 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8. 6) ☐ Other: ____

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-13, 16-18, 20-21, 24, 26-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Hayashi U.S. Patent 5,754,708.

Regarding claim 1, Hayashi teaches an image processing device (abstract), comprising:

A filtering unit (FIG. 8) which filters an input image with variable frequency characteristics (variable edge emphasis adjustment) (FIG. 12 and column 13, lines 16-23);

An edge detection unit which detects magnitudes of edges appearing in the input image (FIG. 1A, element 4b); and

A degree-of-white-likeness detection unit (gray level judging/detection) (FIG. 1B) which detects degrees of white-background likeness in respect of local areas of the input image, wherein said filtering unit changes the variable frequency characteristics in response to the magnitudes of edges (FIG. 12) and to the degrees of white-background likeness (column 14, lines 1-15).

For claim 2, Hayashi teaches the image processing device wherein said degree-of-white-background-likeness detection unit marks white backgrounds and boundary areas adjacent to the white backgrounds as white-background areas, and marks other areas as non-white-background areas (The detection between the dotted image/detected area versus not detected area) (column 2, lines 37-65).



Referring claim 3, Hayashi teaches the image processing device further comprising an edge-magnitude-conversion unit which converts the magnitudes of edges according to the degrees of white-background likeliness, wherein said filtering unit changes the variable frequency characteristics in response to the converted magnitudes of edges (column 13, lines 16-23).

For claim 4, Hayashi teaches the image processing device wherein said edge-magnitude-conversion unit converts the magnitudes of edges such that the variable converts the magnitudes of edges such that the variable frequency characteristics enhances high frequency components to an increased degree at edge areas as the degrees of white-background likeliness increases (gray level adjustment, increases respectively, depends on the white-background likeliness/gray level increases) (column 13, lines 59-67 and column 14, lines 1-19).

For claim 5, Hayashi further teaches the image processing device wherein said filtering unit enhances high frequency characteristics of the variable frequency characteristics of the variable frequency characteristics at edge areas according to the converted magnitudes of edges, the enhancement of the high frequency characteristics being made relative to the variable frequency characteristics applied to non-edge areas (column 13, lines 59-67 and column 14, lines 1-19).

Referring to claim 6, Hayashi teaches the image processing device wherein said filtering unit includes:

A first filter which has a frequency characteristic that is space invariant over all areas of the input image (Hayashi teaches the character/line area filter is giving the output regardless the selected areas of the input image) (FIG. 10, element 8B); and

Art Unit: 2623

A second filter which has a high-frequency-enhancement characteristic, and has an output level thereof being adjusted in response to the converted magnitudes of edges (dotted image filter) (FIG. 10, element 8A).

Regarding claim 7, Hayashi discloses the image processing device wherein the frequency characteristic of said first filter enhances edges while suppressing generating of moiré in mesh-dot image areas (refrain moiré occurrences) (column 13, lines 10-14).

For claim 8, Hayashi also discloses the image processing device wherein said first filter has a band-frequency-enhancement characteristic (smoothing processing) (column 13, lines 10-14 and column 14, lines 20-27).

Regarding claims 9-10, please refer back to claims 1 and 2 respectively for further explanation.

For claim 11, please refer to claim 1 for the explanation of degree-of-white-background-likeliness concept. In addition, Hayashi teaches a gray-level conversion unit which converts gray levels of the input multi-level image according to conversion characteristics that change in response to the degrees of white-background likeliness (column 13, lines 50-55 and column 14, lines 1-15).

Also to claim 12, Hayashi teaches the image processing device wherein said gray-level conversion unit includes:

A plurality of gray-level conversion units (different gray level conversions) converting the gray levels of the input multi-level image according to respective gray-level-conversion characteristics (column 4, lines 7-22); and

Art Unit: 2623

A selection unit (selector) which selects one of said plurality of gray-level conversion units in response to the degrees of white-background likeliness (FIG. 12).

For claim 13, please refer back to claim 2 for the explanation.

Regarding claim 16, Hayashi further teaches the image processing device wherein a gray-level conversion characteristic applied to the white-background areas converts an input gray level of the input multi-level image into a greater value than a gray-level conversion characteristic applied to the non-white-background areas in a range of input gray levels above a predetermined gray level (column 10, lines 1-23).

Regarding claims 17 and 18, please refer to claim 16 for the explanation.

For claim 20, Hayashi further teaches the image processing device wherein the input multi-level image supplied to said degree-of-white-background-likeliness detection unit is an image obtained after a filtering process that has such a frequency characteristic as to smooth isolated dots (FIG. 11, element 81 and column 13, lines 1-14).

Regarding claim 21, Hayashi discloses the image processing device wherein the input multi-level image supplied to said degree-of-white-background-likeliness detection unit is an image obtained after size-change process (FIG. 1, elements 2, 3, 4, 8, 10 and 11).

Regarding claim 24, please refer back to claims 12 and 2 for the explanation.

For claim 26, please refer back to claim 16 for further explanation.

For claim 27, please refer back to claim 11 for the explanation.

Regarding claim 28, please refer back to claim 12 for the explanation.

For claim 29, please refer back to claim 2 for the explanation.

Art Unit: 2623

For claim 30, please refer back to claim 1 for the explanation. Also, Hayashi teaches the image output unit which reproduces the filtered image (FIG. 1, element 11).

Regarding claim 31, please refer back to claim 2 for the explanation.

For claim 32, please refer back to claim 11 and claim 30 for the explanation.

Regarding claim 33, please refer back to claim 12 for the explanation.

For claim 34, please refer back to claim 2 for the explanation.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Hayashi U.S. Patent No. 5,754,708 and Farrell U.S. Patent No. 6,222,642 as applied to claim 11.

Regarding claim 19, as discussed in claim 11, Hayashi teaches the gray-level conversion characteristic applied to the white-background area. In addition, Farrell teaches a method of processing image wherein the gray-level adjustment can be adjusted by user operation (column 3, lines 35-38). Modifying Hayashi's method of processing input images according to Farrell would be able to allow the user to adjust the gray-level of the image and thus improve the quality of the reproduced image. This would improve processing and therefore, it would have been obvious to one of the ordinary skill in the art to modify Hayashi according to Farrell.

Art Unit: 2623

5. Claims 22-23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi U.S. Patent No. 5,754,708 and Sakano U.S. Patent No. 5,473,444 as applied to claim 13 above.

Regarding claim 22, Hayashi teaches a block-generation unit which divides an area-detected image into a plurality of blocks (FIG. 2, FIG. 3, FIG. 6, and FIG. 7). However, Hayashi does not teach the count unit to keep tracks and mark the white-background pixel. Sakano teaches a method processes the image that keeps track and marks white-background pixel detection (FIG. 8 and column 4, lines 5-12). Modifying Hayashi's method of processing input images according to Sakano would be able to distinguish and keep track of white-background pixels in the image processing. This would improve processing and therefore, it would have been obvious to one of ordinary skill in the art to modify Hayashi according to Sakano.

For claim 23, Hayashi further teaches the image processing device wherein the blocks are square shaped (FIG. 3).

Regarding claim 25, Hayashi teaches an area detection unit includes a thresholding unit which carries out thresholding of the input multi-level image to generate a binary image (please refer back to claim 16). In addition, Sakano further teaches the limitation of counting the white pixels (as discussed in claim 22), expansion unit (FIG. 12, element 193 and element 196; and column 4, lines 13-21) and logical AND unit which obtains a logical product of the binary image and an image in which white-background areas are expanded by said expansion unit (FIG. 12, element 194; FIG. 20, element 194; column 4, lines 55-67 and column 5, lines 54-67). Modifying Hayashi's method of processing input images according to Sakano would be able to distinguish, keep track of white-background pixels in the image processing, and further expand

Art Unit: 2623

the white-background pixel according to the count unit for further image processing. This would improve processing and therefore, it would have been obvious to one of the ordinary skill in the art to modify Hayashi according to Sakano.

Allowable Subject Matter

6. Claims 14 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

CONCLUSION

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to edge and gray-level detection with regard to white-background likeliness in general:

U.S. Pat. No. 6,049,635 to Hayashi, teaches dotted image area detecting method.

U.S. Pat. No. 6,026,199 to Sommer, teaches method for halftoning grey level signals.

U.S. Pat. No. 6,608,701 to Loce, teaches compact high addressability rendering.

U.S. Pat. No. 5,323,247 to Parker, teaches method for halftoning and inverse halftoning.

U.S. Pat. No. 5,832,123 to Oyamada, teaches method for producing an enhanced two-grayscale image.

U.S. Pat. No. 6,529,629 to Li, teaches image segmentation method.

U.S. Pat. No. 5,101,446 to Resnikoff, teaches method and apparatus for coding an image.

Art Unit: 2623

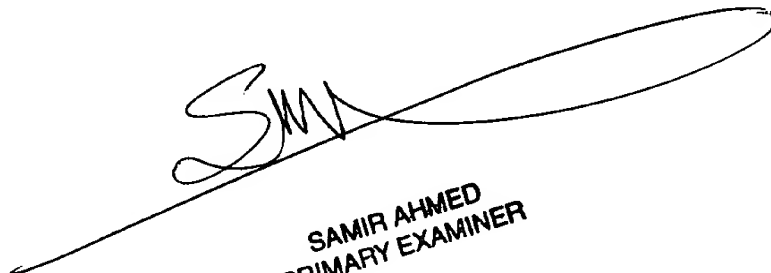
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Q Le whose telephone number is 703-305-5083. The examiner can normally be reached on 8:30 A.M - 5:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to TC Customer Service whose telephone number is 703-306-0377.

BL

January 28, 2004



SAMIR AHMED
PRIMARY EXAMINER